

## Telangana govt proposes to develop 104 link roads in Hyderabad

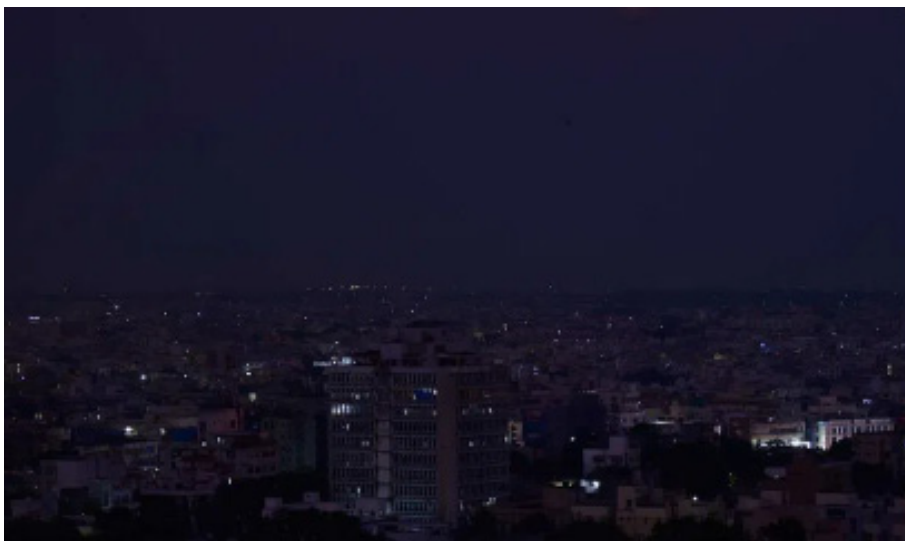
Hyderabad: In a boost to the city's infrastructure, the State government under Missing Links Projects (Phase-III) has proposed to develop 104 link roads at a cost of Rs 2,410 crore. The works related to the development of the link roads will be grounded in the coming days. Among them, in Greater Hyderabad Municipal Corporation (GHMC) limits a total of 72 roads measuring 95.47 km with Rs 1,160 crore will be developed and in its surrounding 10 Urban Local Bodies (ULBs), 32 roads measuring 103.45 km will come up with an estimated cost of Rs 1,250 crore.

Bandlaguda Jagir, Ghatkesar, Kothur, Dammaiguda, Nagaram, Badangapet, Shamshabad, Ibrahimpatnam, Manikonda

and Jawaharnagar are the ULBs where these roads will come up. The objective of proposing these link roads is to improve mobility, ease traffic and enhance the growth of commercial establishments, said Hyderabad Road Development Corporation Limited (HRDCL) in a press release. Following instructions from MA&UD Minister, KT Rama Rao identified 135 link roads with a total length of 126.20 kilometres. Among them, the HRDCL initially took up the development of 37 link roads at a cost of Rs 572.17 crore and completed the development of 21 roads by incurring an expenditure of Rs 273.61 crore while works for the remaining 16 roads underway at a cost of Rs 298.56 crore.



## With drop in temperatures, Hyderabad braces for nippy nights



Hyderabad: Don't put that winter coat away just yet as frigid air is expected to further lower the temperatures in the coming days. Wind chills in Hyderabad are expected to remain in the teens for the next three days, according to the Telangana State Development Planning Society (TSDPS). Fog or mist is also expected during the period. Issuing a yellow-coded warning, the Weather Department said that in almost all areas except Alwal, Quthbullapur, and Musheerabad, the minimum temperatures will drop below 14 degrees Celsius. Tuesday's minimum temperature in Hyderabad was 16.8 degrees Celsius, just over 4 degrees Celsius short of the record low of 12.4 degrees Celsius that was set in 2012. In the last 24 hours, till 8:30 am on Tuesday, the temperatures plummeted with Rajendranagar recording

15.2 degrees Celsius followed by Ramachandrapuram and Patancheru at 15.2 degrees Celsius, Secunderabad (15.8 degrees Celsius), and Gajularamaram (15.8 degrees Celsius). However, these numbers are paltry compared to other districts in the State which are likely to witness a minimum temperature drop to shivering 11 degrees Celsius to 9 degrees Celsius. An orange-coded warning has been issued for Mancherla, Kumuram Bheem Asifabad, and Sangareddy.

The minimum temperature may touch single-digit at 9.4 degrees Celsius in Kumuram Bheem Asifabad on Wednesday. In its main weather observations, IMD noted that the minimum temperature departure on Tuesday was appreciably below normal at isolated places over the State.

## Telangana State Archives and Research Institute to go digital

Hyderabad: Students, research scholars, historians and history enthusiasts will soon be able to access archives of the Telangana State Archives and Research Institute at the click of a button as the institute will soon launch a digital library.

To start with, former Hyderabad Secretariat files from 1896, departmental records of GAD, Home from 1890 to 1947 and Persian records comprising jagirs from 1880-1880, land grants transactions and Army records pertaining to the Nizam period will be made available in the digital library. Following this, a staggering 1.55 lakh historical records pertaining to the Shah Jahan and Aurangzeb periods will be kept in the digital library. Initially, the

Institute will make available archival content as reference material in the digital library and upon request, a photocopy of the material will be provided with user charges. For this initiative, the Institute is coming up with a new website. Access to the digital library will be through the user ID and password.

History enthusiasts and research scholars should register with the Institute and then be provided a user ID and password to access the content. For this digital library, the Institute had already commenced the digitisation of the records. After digitisation, a catalogue for each record is created and the same will be hosted in the digital library. So far, the Institute has successfully digitized over 25,000 records.



# The unusual 'mutations' that protect humans from viruses | Explained

Anyone can access all the research papers in medicine and biology via the free search engine PubMed. Do a PubMed search for "cancer" and you will get links to 4.97 million papers, with the most recent first. Querying for "gene" yields 3.34 million links, "viruses" 1.44 million, and "mutations" 1.27 million. The numbers increase by the day. But search for "paramutations" and you should find only some 220 papers or so. This is because research on paramutations is only just taking off. Many people know that mutations in genes can cause cancer. And the COVID-19 pandemic heightened people's awareness of, and dread towards, viruses. In this milieu, paramutations are changes that can protect humans against viruses. Researchers Almero Scarpa and Robert Kofler, of the Institute for Population Genetics in Vienna, Austria, showed how they do so in a paper published in the journal *Genetics* on October 11. Chromosomes and genes

Each cell in our bodies has 23 pairs of chromosomes. One of each pair is inherited from each parent. Every chromosome contains one long DNA molecule plus several chromosomal proteins. The DNA is made of four compounds called bases. A gene is a specific sequence of bases in the DNA. When a gene is expressed, it means the sequence is copied onto the sequence of bases in a related molecule, called RNA. The RNA base sequence then tells the cell the sequence of amino acids required to make the protein coded by the gene. In this way, the gene directs the synthesis of a protein, with DNA and RNA as the gene's master and working copies. Springing the trap

The piRNA cluster is a different type of gene. The RNA from a piRNA cluster is not used to make a protein. Instead, it is cut into shorter pieces of 23-30 bases called piRNA – short for piwi-interacting RNA. The piRNA is associated with proteins belonging to the piwi family. The piwi-piRNA complex is a search-and-destroy weapon. The piRNA guides the search for RNA and DNA that have the same sequence as the piRNA, and the piwi proteins destroy the targeted RNA, or simply turn 'off' the targeted gene. Effectively, the piRNA cluster is a virus trap. When a virus infects a cell, its DNA integrates into the host cell's DNA. If by chance it integrates into a piRNA cluster, the cluster will develop the ability to make piRNA that can identify the same sequence in the host RNA and DNA and destroy it. Simply put, the host DNA co-opts the trapped virus to make an antiviral agent. The fruit fly (*Drosophila melanogaster*) has been the workhorse of genetics research since 1901. piRNA clusters make up around 3% of its genome. Profs. Scarpa and Kofler used computer simulations to find that the antiviral action of piRNA clusters is amplified manifold by paramutation. That is, paramutations helped fly populations become virus resistant faster.

What are paramutations?

A mutation is any change in the sequence of bases in the DNA of a chromosome. A paramutation is a small chemical modification of a chromosomal protein: it

flips a nearby gene into a silenced state. So the active and silenced versions of a paramutated gene share the same DNA sequence but their associated proteins have different modifications. Paramutation originally referred only to interaction between the maternally and the paternally derived copies of the same gene. The protein modification associated with one copy was copied to the protein associated with the other, and both copies were silenced. This perpetuated the paramutated state into succeeding generations. Today, we know that the interaction that triggers the modification involves piRNA and other short RNAs, and thus depends on the DNA sequence. So paramutation now refers to interaction between genes that share the same or similar DNA sequence, regardless of their chromosome location. Paramutations vs. viruses The piRNA from one cluster can paramutate viral DNA copies inserted elsewhere in the genome, outside of the clusters. As a result, the paramutated insertion is switched from making viral proteins to making more piRNA. This is the mechanism the new study unearthed. However, not all insertions of the virus are amenable to being paramutated. We also don't know why some insertions are more paramutable than others. Paramutation in plants William Bateson and Caroline Pellew discovered the first paramutation in the culinary pea (*Pisum sativum*) and reported it in 1915 in the *Journal of Genetics*. Bateson was one



of the first editors of this journal (the author is the current editor); he also coined the term 'genetics' to describe the study of heredity. Among other differences from cultivated peas, the paramutated plants also made smaller and less sweet seeds. Farmers called them "rogues". (To rogue is to remove inferior or defective plants or seedlings.) Rogues bred true and had only rogue offspring, and crosses between rogue and the desired variety yielded only rogue offspring. Agricultural scientists have made great efforts to exterminate rogues, although the first substantive advance in understanding rogue peas came only in 2021. Then, researchers of the University

of Algarve, Portugal, reported having isolated a mutant that had lost its rogue characteristics, giving scientists a foot in the door to figure out how rogue and non-rogue plants differ. Paramutation is arguably one of nature's more closely guarded secrets. While we now have the complete DNA sequence of hundreds of plants and animals, as well as of tens of thousands of people, the documentation of their myriad chromosomal proteins and RNAs has only just begun. The similarities and differences between animal and plant paramutation is still relatively rudimentary. So we can expect exciting discoveries even before PubMed throws up the 250th link.

## Brazil's superb win secures progress in FIFA U-17 World Cup

Hyderabad: The result means both sides qualify for the last 16, with England as group winners and the South Americans as runners-up. The result means both sides qualify for the last 16, with England as group winners and the South Americans as runners-up. It has been a tournament full of spectacular goals — and England's Matty Warhurst came within fractions of adding to that collection when he crashed a ferocious effort against the bar in 20 minutes. The sides traded chances throughout a pulsating first half and the woodwork was struck again before long, with Brazil forward Estevao Willian's 20-yard effort cannoning off the post.

The breakthrough was made just before the interval, Kaua Elias netting his fourth goal of the tournament with a controlled low volley. A Selecao started the second half confidently and extended their lead when Da Mata headed in from Lucas Camilo's inviting cross. England fought hard to get back in the game and were awarded a penalty when Joel Ndala was brought down by Pedro Lima. Ndala himself stepped up to hammer the spot-kick home and give the young Lions a lifeline. Ryan Garry's side struggled to build



Both teams secure a spot in the last 16, with England clinching the group's top position and the South Americans claiming the runner-up spot

up any sustained momentum thereafter, however, and it was Brazil who looked the

more likely to score in the game's final stages.

# 5 YEARS OF GLITTER: ORAFO JEWELS LAUNCHES E-COMMERCE PLATFORM

Inauguration by Balagam Telugu Movie Fame Lead Actress Miss Kavya Kalyanram

In a glittering celebration marking its 5th anniversary, Orafo Jewels, the first Silver Jewellery brand of Hyderabad, proudly launches its exclusive E-Commerce platform ([www.orafojewels.in](http://www.orafojewels.in)). The inauguration took place on November 18, 2023, at 11:00 am, graced by the presence of Balagam Telugu Movie Fame Lead Actress, Miss Kavya Kalyanram. Orafo Jewels, with its flagship showroom at Somajiguda circle and two additional showrooms at Suchitra x roads, has expanded its presence with a new showroom at A.S.RAO NAGAR main road. The brand, celebrating five years of successful business, envisions providing value-appreciating products in 92.5 precious silver jewellery. Kalyan Ram, Director of ORAFO JEWELS, expressed excitement about the brand's evolution. He highlighted their initiation of customized designer precious jewellery buying five years ago and announced plans to open chain-exclusive showrooms across Telangana and Andhra Pradesh in a franchise model.

Amid soaring gold prices and the pandemic impacting economies, the silver jewellery industry has gained momentum, emerging as a preferred alternative to gold. Orafo Jewels aligns itself with this trend,

boasting a 24% growth over the last 5 years. Recognizing the shift in consumer preferences towards online shopping, Orafo Jewels launches its standalone E-Commerce website.

The user-friendly and feature-driven website, [www.orafojewels.in](http://www.orafojewels.in), provides an interactive platform for customers to explore and purchase precious silver jewellery. Features include video call facility for more collections, interactive chat for showroom access, and various payment gateways. Free shipping is available within India, with international shipping options. Orafo Jewels aims to establish itself as a preferred family brand in the silver jewellery category, projecting a 25% annual growth. The brand plans to open 25 showrooms across southern India in the next 3 years, targeting a turnover of 50 crores and developing a franchise network for the E-Commerce business pan India.

As a token of gratitude, Orafo Jewels celebrates 5 years of glitter with exclusive offers and a wide array of jewellery for all occasions. Until November 18, 2023, customers can enjoy up to 18% off on select jewellery, and through a lucky draw, five customers stand a chance to win free sil-



ver coins weighing 250 grams each. Orafo Jewels offers an extensive range, including temple jewellery, precious stone jewellery, CZ-studded jewellery, imported silver casual wear, Swarovski collections, Men's collections, kids collections, and gifting products. The brand specializes in ex-

clusive bridal collections, offering customization to fit every bride's budget and desires.

Customer-centric policies include a lifetime maintenance facility, buy-back (exchange) facility, digital catalog for NRI customers, shopping on a video call facility, and free shipping across India.

## U.S. President Joe Biden urges APEC members to ensure AI brings change for better



U.S. President Joe Biden on Friday urged Asia-Pacific economies to work together to ensure that artificial intelligence (AI) brings change for the better, and not to abuse workers or limit potential. Addressing the final session of a two-day summit of the 21-member Asia Pacific Economic Cooperation (APEC) forum in San Francisco, Biden said he had briefly discussed AI with Chinese President Xi Jinping in talks on the sidelines of APEC on Wednesday. Biden has used the two-day APEC summit to highlight the strong U.S. economy and its ties to other Pacific

nations, even as his vision for greater regional cooperation to counter China's influence stumbled on the trade front over his bid to strengthen workers' rights. "We're going to see more technological change in the next 10 years than we've seen the last 50 years," Biden said, as Xi looked on a few places to his left at a circular conference table. "Together we have to make sure it changes for the better." Biden said digital technologies like AI must be used to "uplift, not limit, the potential of our people," and noted that the United States had brought together leading AI companies in the sum-

mer to agree voluntary commitments "to keep AI systems safe and trustworthy." The steps, he said, included committing to ensuring the security of AI systems before releasing them to the public, watermarking AI-generated content to show it has been generated by artificial intelligence and minimising the risk AI systems posed to society, such as by promoting bias or discrimination. Biden also noted that he

had signed an executive order last month to set new AI standards, such as requiring developers of the most powerful AI systems to share their safety test results with the government, and to strengthen technologies to protect privacy and prevent employers from using AI to exploit workers. Meanwhile, Washington was expanding grants for AI research in key areas like healthcare and climate change, he said.

## Protests erupt against Congress across Hyderabad

Hyderabad: A day after former union Minister P Chidambaram tendered apologies for the death of many youngsters during separate State agitation, protests erupted against the Congress party at many places in the city, even as the top brass of the congress made a beeline to Telangana on Friday. Holding placards and raising "Rahul go back" slogans, many Osmania University students staged protests at Martyrs Memorial and Srikantha Chari's statue in LB Nagar junction. They stated that Congress party was responsible for the loss of many youngsters as it delayed the separate statehood for Telangana. Telangana

martyr Srikantha Chari had set himself ablaze as the Congress had deliberately delayed the formation of Telangana by constituting different committees. Likewise, many Telangana youngsters had lost lives due to Congress party's dirty politics, the students said at Martyrs Memorial. The Congress, which was responsible for the death of many Telangana youngsters, should be chased away. After promising Telangana in 2004, the Congress took a 'U' turn and as a result, many had committed suicides, Osmania University Joint Action Committee convener Mandala Bhaskar said.

# The Creek Planet School Venus Campus Annual Day



The Creek Planet School Venus Campus celebrated its annual day -with the theme 'Cosmic Lam-be-Gus: The way ahead!', on 18th November 2023 with great vibrancy and elation. The programme commenced with the lighting of the lamp followed by the soulful rendition of the captivating musical performance by the school's orchestra.

Mr. Sandeep Sandra, motivational speaker was the esteemed Chief Guest, with all the dignitaries: Vice Chairman-Mr. T. Panduranga Chary, Founder and Director- Mr. Narendra Prasad

Edupuganti, Futuristic Edu Initiatives Head Academics-Dr. Jayashree Nair. The school Principal, Ms. Sujatha Naidu Sayana, addressed the gathering, expressing her pride in the students' accomplishments in the annual report and thanked the teachers and parents for their unwavering support.

The highlight of the event was the cultural extravaganza where students from various grades showcased their talents through dance, mime, and music. Each performance was a testament to the dedication and hard work put in by both the



students and the teachers. The audience was mesmerized by the vibrant dances that depicted diverse cultural traditions of now and near future, from classical forms to contemporary styles. The annual day celebration was not just a platform for entertainment but also a reflection of the school's commitment to holistic education. It fostered a sense of camaraderie and encouraged the spirit of healthy competition among the students. Besides cultural displays, the event also honored academic achievers and acknowledged the efforts of students who excelled in for the year 2022-23.

Parents and attendees were full of praise for the school's efforts in organizing such a spectacular event, praising the dedication of the students and staff that made the evening a resounding success. As the curtains drew to a close, the reverberating applause echoed the appreciation for the incredible performances. The annual day celebrations at The Creek Planet School Venus campus will undoubtedly remain etched in the memories of all those who attended, leaving a legacy of talent, unity, and celebration.

## Cryogenic upper stage of Chandrayaan-3's launch vehicle makes uncontrolled re-entry into the Earth's atmosphere



The Indian Space Research Organisation (ISRO) has said that the cryogenic upper stage of the LVM3 M4 launch vehicle which launched India's Chandrayaan-3 moon mission has made an uncontrolled re-entry into the Earth's atmosphere on November 15. "The cryogenic upper stage of the LVM3 M4 launch

vehicle made an uncontrolled re-entry into the Earth's atmosphere, around 2.42 pm today. The probable impact point was predicted over the North Pacific Ocean," ISRO said. "This rocket body (NORAD id 57321) was part of the vehicle that successfully injected the Chandrayaan-3 spacecraft into the intended orbit of 133 km x 35823 km

with a 21.3o inclination on July 14, 2023," the space agency said. It added that the re-entry of the rocket body took place within 124 days of its launch. "The post-mission orbital lifetime of the LVM3 M4 Cryogenic upper Stage is, thus, fully compliant with the "25-year rule" for LEO (Low Earth Orbit) objects as recommended by the Inter-Agency Space Debris Coordination Committee (IADC)," ISRO said.

It further added that post-Chandrayaan-3 injection, the upper stage had also undergone passivation to remove all residual propellant and energy sources to minimise the risks of accidental explosions as per the space debris mitigation guidelines prescribed by the United Na-

tions and IADC. Passivation and Post-mission disposal of this rocket body in adherence to the internationally accepted guidelines once again reaffirms India's commitment to preserve the long-term sustainability of outer space activities. India's third moon mission, Chandrayaan-3, was successfully launched onboard a Launch Vehicle Mark-3 (LVM-3) rocket from the second launch pad at the Satish Dhawan Space Centre in Sriharikota on July 14. On August 23, India became the fourth country to successfully land on the moon as the Chandrayaan-3's lander module successfully made a soft landing on the lunar surface and the first nation to touch down on the polar region of the moon.

## BRS candidate Anil confident of winning Boath assembly

Adilabad: Buoyed by the success of Chief Minister K Chandrashekhara Rao's recent poll rally in Echoda mandal headquarters, BRS nominee Anil Jadhav exuded confidence that he would easily win from

Boath segment by thumping majority with the help of innovative schemes and developmental activities in nine and half years. In an interview with Telangana Today, Anil explained about his canvassing and prospects.

# Infosys Science Foundation announces 6 prize winners for 2023

The Infosys Prize is given in six categories – Engineering and Computer Science, Humanities, Life Sciences, Mathematical Sciences, Physical Sciences, and Social Sciences. The two recipients from Bengaluru are Jahnavi Phalkey, founding director, Science Gallery Bengaluru, and Mukund Thattai, professor, Biochemistry, Biophysics and Bioinformatics at National Centre for Biological Sciences (NCBS).

The prize for each category comprises a gold medal, a citation, and a purse of \$100,000 (or its equivalent in rupees). The awards will be presented on January 13, 2024. The recipients of Infosys Prize 2023 were shortlisted from 224 nominations by an international panel of jurors comprising world-renowned scholars and experts. Kris Gopalakrishnan, president, Infosys Science Foundation, said, "This year marks a landmark moment in Infosys Science Foundation's journey. Over the course of 15 years, the Infosys Prize has recognized mid-career researchers who have done impactful, groundbreaking work across disciplines. The prize has helped drive conversations around their work and, on a larger scale, created meaningful engagement around science and society. I congratulate the winners of the Infosys Prize 2023." Winners of the Infosys Prize 2023: Engineering and Computer Science The Infosys Prize 2023 in Engineering and Computer Science is awarded to Sachchida Nand Tripathi, Professor, Sustainable Energy Engineering (SEE), IIT-Kanpur, for the deployment of large-scale sensor-based air quality network and mobile laboratory for hyper local measurement of pollution, data generation and analysis using artificial intelligence and machine learning for effective air quality management and citizens awareness. Prof. Tripathi's work has shown that the important differences between observations of winter haze formation in Delhi and those in other places like Beijing (China) are that the nano-particle growth rate in Delhi is much higher and happens at night without photochemistry. This finding holds the key to mitigating air pollution in India. Humanities The Infosys Prize 2023 in Humanities is awarded to Jahnavi Phalkey, founding director, Science Gallery Bengaluru, for her granular insights into the individual, institutional, and material histories of scientific research in modern India. Her book, *The Atomic State*, and many articles insightfully braid the global history of science, especially nuclear science, with the anthropology of the postcolonial state to illuminate rich and textured histories of the everyday lives of science in India. Dr. Phalkey's work has emphasized the need to see the history of science as much as a history of scientific ideas, as one of power, practice, and the nation-state.

The Infosys Prize 2023 in Life Sciences is awarded to Arun Kumar Shukla, Professor, Biological Sciences and Bioengineering, IIT-Kanpur, for his outstanding and far-reaching contribution to the field of G-protein coupled receptor (GPCR) biology. Prof. Shukla's research has established a new understanding of

GPCRs, which are one of the most important classes of drug targets. His work has opened up previously uncharted avenues for designing novel and effective therapeutics. The Infosys Prize 2023 in Mathematical Sciences is awarded to Bhargav Bhatt, Fernholz Joint Professor at the Institute for Advanced Study and Princeton University, for his outstanding and fundamental contribution to arithmetic geometry and commutative algebra. Prof. Bhatt's joint work in prismatic cohomology, with German mathematician Peter Scholze, introduces new ideas and powerful methods in this area at the heart of pure mathematics. The Infosys Prize 2023 in Physical Sciences is awarded to Mukund Thattai, Professor, Biochemistry, Biophysics and Bioinformatics, National Centre for Biological Sciences (NCBS), Bengaluru in recognition of his groundbreaking contribution to evolutionary cell biology. Prof. Thattai is a physicist who researches how complex cellular organization emerged from microscopic disorder. His work could have profound implications in one of biology's central mysteries of how complex cells emerged from primordial ones. He is among the pioneers of the physics of life.



The Infosys Prize 2023 in Social Sciences is awarded to Karuna Mantena, Professor, Political Science, Columbia University for her groundbreaking research on the theory of imperial rule, and the claim that this late imperial ideology became one of the important factors in the emergence of modern social theory. Her book *Alibis of Empire* and related papers are landmark

publications in political theory with implications for all social sciences. Her book helps us understand that the dramatic shift in imperial policy, following the 1857 rebellion in India, was not a straightforward reaction to this traumatic event, but legitimated by a new ideology of indirect imperial rule that was carefully crafted by the ingenious conceptual work of thinker-administrators, such as Henry Maine.

## How can India monitor air pollution-related illnesses effectively? | Explained

The story so far: For a brief period in October, Mumbai's air quality matched the stifling haze that covered the national capital, where people complained of burning eyes, choking and troubled breathing. The Air Quality Index (AQI) across different parts of Maharashtra turned from orange ("poor") to red ("very poor"), crossing the 300 mark. Maharashtra's health department this week, in its first communique since residents complained of the 'toxic' air, introduced a 'Health Action Plan.' The civic body will monitor how elevated AQI levels affect pollution-related illnesses across 17 regions. Districts will strengthen surveillance programs to track, how many cardiac, respiratory and other such conditions were reported in a spot with a high AQI.

Three of the world's 10 most polluted cities are in India right now, says Swiss group IQAir. India is also witnessing multiple health alarm bells go off at once — cancer, diabetes and cardiovascular diseases have been called 'ticking time bombs', as non-communicable diseases pose a health and economic burden. The 2020 State of Global Air termed air pollution the 'biggest health risk in India,' as indoor and outdoor air pollution in 2019 contributed to more than 16.7 lakh deaths linked to stroke, heart attack, diabetes, lung cancer, chronic lung diseases and neonatal diseases. Weaving health in climate action plans helps plot local patterns of diseases related to air pollution, says Dr. Pallavi Pant, who leads the Health Effects

Institute's Global Health programme; the data can piece together a geographic and epidemiological picture of communities most exposed to bad air, helping to reduce climate inequalities in the long run.

Which illnesses are currently attributed to air pollution?

Research has documented the health risks of particle pollution, a common air pollutant generated by the burning of fossil fuels. Two studies published in international journals last week linked type 2 diabetes incidents with "long-term exposure to ambient PM2.5" in Delhi and Chennai. Air pollution also inflames the risk of obesity, asthma, and cardiovascular disease; people are also vulnerable to dementia and Alzheimer's disease as bad air impacts cognitive ability. Pollution could trigger lung cancer in non-smokers, too, one study found. The fine PM2.5 particles (about 30 times smaller than a human hair) travel into the respiratory tract, settle into the lungs and can even enter the bloodstream, triggering immediate and chronic concerns. PM2.5, and its slightly bigger cousin PM10, may both cause irritation in the eye, nose, and throat, along with breathlessness, headaches, coughing and sneezing. In the long run, chronic exposure to PM2.5 could be fatal, as the particulate matter affects every organ in the body and exacerbates underlying conditions. PM 2.5 concentrations originating from fossil fuels in the ambient air caused at least 25 lakh premature deaths in India five years ago, one re-

port found. Children and adolescents are most vulnerable: more than one lakh infants in India died due to air pollution within one month of being born in 2019. Despite proven risks, "climate action plans are not adequately taking into account the health effects of air pollution," Dr. Pant says. All about Particulate Matter

PM10 (particles with a diameter of 10 micrometers or less) are released in the air due to construction and industrial activities, or wildfires. They deposit on the lung surface, inducing tissue damage over time and compromising the lung's ability to fight inflammation. PM2.5-5 rise due to emissions from burning wood, diesel fuel, oil or gasoline. These tinier particles are more likely to travel into and settle deeper in the lungs, while also affecting other body parts.

How does Maharashtra propose to monitor illness?

An Indian Express investigation revealed that Brihanmumbai Municipal Corporation (BMC) had failed to issue, and did not have, health advisories for people despite a growing trend of poor air quality. "Mumbai observed 66 poor and very poor air quality days as compared to just 28 in the past three years' average," Professor Gufran Baig of the National Institute of Advanced Studies (IISc, Bengaluru) observed in a report. A Division Bench of the Bombay High Court on November 1 also took suo moto cognizance of Mumbai's deteriorating air quality.

# Madhya Pradesh in the bottom half of all State-level rankings | Data

The Madhya Pradesh Assembly elections took place on November 17. A comparison of the economic, social, and environmental indicators of the State with the indicators of other States shows that Madhya Pradesh features at the bottom half. Also, its relative ranking among the States remained stagnant in most of the indicators between 2015-16 and 2019-21. Table 1 | The table lists Madhya Pradesh's rank in social indicators and its actual score in an indicator in 2019-21, 2015-16, and 2005-06. It also shows the change in rank in 2019-21 from 2015-16. The performance of the top three States in the indicator is also given for comparison.

For instance, Madhya Pradesh had 35.7% stunted children (low height-for-age) in 2019-21, and ranked 25 out of 30 States. The three best-performing States that year were Kerala (23.4%), Punjab (24.5%), and Tamil Nadu (25%). In this indicator, Madhya Pradesh's ranking improved by just one spot in 2019-21 from 2015-16, the year when the State was placed 26th out of the 30 States. Across most social indicators, there has been no notable improvement in the last few years. For instance, the share of girls/women who attended school was 64% in 2015-16 and improved to only 67.5% in 2019-21. Only those aged six and above were considered. The share of underweight children (low weight-for-age) improved marginally from 42.8% to 33%, while the infant mortality rate recorded a small improvement from 51.2 to 41.3. The State's ranking in the parameter of underweight children improved only by two spots (from 28 to 26), and in the parameter of infant mortality rate only by one spot (28 to 27), among the 30 States considered.

In fact, a comparison with data from 2005-06 shows that the rankings have hardly improved since. In that period, Madhya Pradesh ranked at the bottom of the table in many social indicators. It no longer holds that dubious distinction. For instance, in 2005-06, the State ranked at the bottom of the list in the share of wasted children (weight-for-height) and underweight children. In 2005-06, only 28 States were considered for comparison; the data of Telangana and Andhra Pradesh were ignored. Table 2 | The table shows Madhya Pradesh's actual score in the human development index (HDI) and the change in rank in 2021, compared to 1990. Given the inferior social rankings, Madhya Pradesh's rank in the Human Development Index (HDI) remained poor in 1990 and 2021 as well. In 1990, its HDI ranking was 26 of 30 States; this slid to 27 in 2021. (Table 2). Table 3 | The table shows Madhya Pradesh's per capita net state domestic product and its change in rank in 2021-22, compared to 1993-94. Madhya Pradesh's economic performance is among the worst in the country. In fact, its ranking worsened between 1993-94 and 2021-22. In 1993-94, the State ranked 19 of 27 States in Per Capita Net State Domestic Product (current prices), as seen in Table 3. This declined by two spots in 2021-22. Notably, over half the population in the State belongs to the lowest two wealth quintiles

(Table 4). Table 4 | The table shows the share of the population belonging to the lowest two wealth quintiles in Madhya Pradesh. Madhya Pradesh's manufacturing sector employed around 7% of the State's workforce and the sector's share in total Gross Value Added was about 9%. The State ranks at the bottom half of the table in both measures (Table 5).

Table 5 | The table shows Madhya Pradesh's rank in indicators related to manufacturing. In educational indicators, in 2020, Madhya Pradesh ranked over 20 of the 30 States on indicators such as enrolment in elementary, higher secondary, and college-level education. The Gross Enrolment Ratio in higher education was only 21.5%. (Table 6). Table 6 | The table shows Madhya Pradesh's rank in indicators related to education. While the State lags behind the country in terms of economic performance, it is better in environment-related indicators (Table 7). The State generated a relatively lower amount of haz-



ardous and plastic waste and featured at the top half of the State lists. Table 7 | The table shows Madhya Pradesh's rank in environment-related indicators. Source:

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## How was the first vaccine for chikungunya approved? | Explained

The story so far: On November 9, the world's first vaccine for chikungunya was approved by the Food and Drug Administration (FDA) in the U.S. The vaccine has been developed by European vaccine manufacturer Valneva and will be available under the brand Ixchiq, and has been approved for administration in people who are 18 years or older, and are at increased risk of exposure to the virus. It was approved using the Accelerated Approval pathway, which allows the FDA to clear certain products for serious or life-threatening conditions based on evidence of a product's effectiveness that is likely to provide clinical benefit.

What is chikungunya?

Chikungunya, is characterised by severe joint pain and impaired mobility, and comes with fever. It is a viral infection (CHIKV) transmitted primarily by the Aedes aegypti and Aedes albopictus mosquitoes and has been described as "an emerging global health threat." The WHO fact sheet says Chikungunya is prevalent in Africa, Asia, and the Americas; but sporadic outbreaks have been reported in other regions. Since 2004, outbreaks of CHIKV have become more frequent and widespread, partly due to viral adaptations allowing the virus to be spread more easily by the Aedes albopictus mosquitoes. The joint pain is often debilitating and varies in duration; it can last for a few days, but also be prolonged over months. Other symptoms include joint swelling, muscle pain, headache, nausea, fatigue and rash. While severe symptoms and deaths from chikungunya are rare and usually related

to other coexisting health problems, it is believed that the numbers are generally underestimated, because chikungunya is often misdiagnosed as dengue or zika, as symptoms can seem similar. As of now, there is no cure, only symptomatic relief, with analgesics to help with the pain, antipyretics for the fever, rest, and adequate fluids. Prevention includes mosquito control activities, primarily falling under public health outreach and routine civic maintenance. Individuals are also advised to use medicated mosquito nets and ensure that there is no water stagnation in any containers at home, in order to prevent the breeding of mosquitoes.

What is the vaccine composition?

Ixchiq is administered as a single dose by injection into the muscle. It contains a live, weakened version of the chikungunya virus and may cause symptoms in the vaccine recipient similar to those experienced by people who have the disease. Its safety was evaluated in two clinical studies conducted in North America in which about 3,500 participants, 18 years of age and older, received a dose of the vaccine with the other study including about 1,000 participants receiving a placebo. The most reported side effects by vaccine recipients were headache, fatigue, muscle pain, joint pain, fever, nausea and tenderness at the injection site. The effectiveness of the vaccine was based on immune response data from a clinical study conducted in the U.S. in individuals 18 years of age and older. In this study, the immune response of 266 participants who received the vaccine was compared to the

immune response of 96 participants who received the placebo. The level of antibody evaluated in study participants was based on a level shown to be protective in non-human primates that had received blood from people who had been vaccinated.

What role will the vaccine play?

Peter Marks, director of the FDA's Center for Biologics Evaluation and Research, added in the statement, "Today's approval addresses an unmet medical need and is an important advancement in the prevention of a potentially debilitating disease with limited treatment options." Hopefully, inspired by the fast-track pathway drawn up by research into COVID, this approval will fast track the roll out of vaccines in countries where chikungunya is more prevalent, including Brazil, Paraguay, India (as per the National Centre for Vector Borne Diseases Control, India had 93,455 suspected chikungunya cases until September in 2023), and parts of western Africa. On November 9, the world's first vaccine for chikungunya was approved by the Food and Drug Administration (FDA) in the U.S. Chikungunya, is characterised by severe joint pain and impaired mobility, and comes with fever. It is a viral infection (CHIKV) transmitted primarily by the Aedes aegypti and Aedes albopictus mosquitoes and has been described as "an emerging global health threat." Ixchiq is administered as a single dose by injection into the muscle. It contains a live, weakened version of the chikungunya virus and may cause symptoms in the vaccine recipient similar to those experienced by people who have the disease.

# Uncertain future in a sea of poppies

When Sunder Bai's husband, Shiv Narayan, died during the COVID-19 pandemic, she inherited 1 square kilometre of land and his licence to cultivate opium. She lives with her daughter and son in a village near Nayagaon in Neemuch district on the Madhya-Pradesh Rajasthan border. "Both my children, who are graduates, support and help me in this profession," says Bai. "We employ four or five people to cultivate opium and extract opium gum." Bai's son Anil, 25, who holds a degree in physics, has decided not to find a job and instead help his mother on the farm. Opium cultivation is known as swabhiman ki kheti (agriculture of dignity) in the Mewar region that is spread across Madhya Pradesh and Rajasthan. There is so much pride in the age-old trade that a saying in this area goes, "Afeem aur aulat barabar (poppy plants and children deserve similar treatment)". While farmers in Madhya Pradesh call the crop afeem, a name which finds its origin in Persia, the community in

Entire families in this region usually cultivate opium from November to March; some have doing this for as long as 200 years. Young men and women protect the family licence for various reasons. "One reason is that it increases their marriage prospects," says Parmanand Patidar, a farmer, laughing. Bai had been cultivating opium with Narayan for about 20 years before he died. Anil says the job is not easy. "The procurement rate for opium hasn't increased in many years (farmers get ₹1,200-2,000 per kilogramme of opium latex based on the concentration of morphine in it) and the input cost has increased due to the price rise of fertilizers, labour costs, and pesticides. We also have to be vigilant all the time. We go to the field even at night to ensure that the crop is secure from thieves. We also cultivate other crops to manage our expenses. But we will continue to cultivate opium as it is a family practice," he says with pride. Apart from worrying about inflation, opium farmers have been agitated ever since the sector was opened up to private players through a Union government policy in 2021. The farmers increasingly worry that this move will threaten their livelihood, affect their profits and family businesses, and also have a bearing on "national security" by potentially increasing the problem of drug abuse.

Opium production in India In India, there are about 1 lakh farmers across 22 districts in Madhya Pradesh, Rajasthan, and Uttar Pradesh with a licence to cultivate opium. The majority of them are from three districts that border Madhya Pradesh and Rajasthan — Mandsaur, Neemuch, and Chittorgarh. Together, these districts produce 80% of India's opium. Opium is obtained by slightly incising the seed capsules of the poppy after the plant's flower petals have fallen. Two types of narcotic raw materials can be produced from opium poppy: opium gum (latex) and the concentrate of poppy straw (CPS). Until recently, only opium gum, a milky substance, was produced in India. Opium contains morphine, which is known to relieve chronic pain and is used mostly by the pharmaceutical industry to produce medicines, and codeine. On the flip side, it also produces opioids like heroin. Because it is an addictive substance that can cause mental

clouding and hallucinations, opium production is highly regulated in India. In the Mewar region, farmers collect opium gum and send it to Government Opium Alkaloid Works, Neemuch, a factory that began operations in 1935. The gum is procured solely by the Central Bureau of Narcotics, which functions under the Union Finance Ministry.

Change in policy However, in the 2021-22 crop year, the Union government changed its opium policy, allowing private players to produce CPS from the opium poppy to boost the yield of alkaloids. According to a document titled 'An outlook of opium cultivation' provided by the Central Bureau of Narcotics on its website, other opium-growing countries follow the process of extracting alkaloids from CPS. "After a shift to the CPS method, India will be on a par with other nations. As other countries have already shifted to the CPS method, the demand for Indian opium in global market is reducing. This is evident from the decreasing export of opium. (Moving to) CPS provides an opportunity for India to regain its market place through the export of CPS. CPS is less labour-intensive than the lancing method (used by farmers now). It will also help in ensuring better drug law enforcement as it will reduce the illicit market for opium gum," the government says. In a press release dated September 14, the government said that it has been engaging with the private sector on processing opium gum as well as poppy straws to augment the opium-processing capacity of India. The press release read, "Government intends to further significantly expand the licensing for un-lanced poppy and has decided to set up a processing unit for Concentrate of Poppy Straw of 100MT capacity on a PPP (public-private partnership) basis." This is the second crop season since the policy was revised. Various farmers organisations such as All India Kisan Sabha, Bharatiya Afeem Kisan Sangharsh Samiti, and Bharatiya Afeem Vikas Samiti formed the Samyukt Afeem Kisan Morcha to raise the issues of opium farmers. When Prime Minister Narendra Modi visited Neemuch to address an election rally last week, these farmers' organisations tried to meet him. Modi did not meet them, so they have sent him a memorandum demanding that the CPS system be withdrawn, and the traditional system of extracting opium gum be continued. Farmers believe that private companies are likely to pose a threat not just to their profession, but also to national security. "Opium can be misused. What if the drug mafia gets access to alkaloids? Drugs will be rampant here," worries Mahesh Vyas, a farmers' leader from Mandsaur. Justice G.D. Saxena, a retired judge of the Madhya Pradesh High Court and a resident of Mandsaur, expresses similar concerns. "Opium is reportedly coming to Mandsaur from illegally cultivated areas too. States like Punjab are struggling to control synthetic drugs. Allowing private entry in opium processing should be done with extreme caution," he warns.

The former judge remembers opium being very common in the area when he was young. He says it took several years to restrict and regulate the crop and bring it completely under the government's control. Shailendra Singh Thakur lost his



job at the Neemuch factory some years ago for protesting against the erstwhile United Progressive Alliance government's plan to privatise the production of opium. "When opium production is handed over to private companies, the safety and security of the alkaloids may come under question. Importantly, life-saving medicines which are made using opium will become costly and poor patients will suffer. Also, recently, narcotics of huge volumes were confiscated from a private port in Gujarat. This is a warning," he says. Heroin worth ₹11 crore was seized in Assam just this week. "The production of alkaloids was monopolised by the government. It should remain that way." Thakur also believes that government alkaloid factories have the capacity to produce more opium. "Employ more people. Why give this to private companies? Right now, five people get steady employment for about three months from cultivating 10 ares (100 sq m) of opium fields." Farmers also worry that there are no new postings in the Neemuch factory. Against the sanctioned strength of more than 500 posts, there are just about 200 employees in the factory. The farmers and trade union representatives believe that this is a ploy to help private companies. They demand that more factories be introduced under the public sector with more people working in them so that alkaloids can be produced with strict government control.

A group of farmers from Pipliya in Mandsaur say that "private companies will issue their diktat in this sector." Pipliya was the site of an agitation by opium farmers demanding better prices for their produce in 2017. The protest took a terrible turn when six farmers were killed in police firing. The Bharatiya Janata Party (BJP) blamed opium smugglers for instigating the community. Now, the farmers accuse the government of trying to "create divisions with two systems". They say that the Centre has introduced a policy that is reminiscent of the British era. They have heard stories about the East India Company smuggling opium from their region and exporting it to China and other countries. "Big companies will misuse this crop to maximise profit. If smugglers have stolen opium from government factories, what security can be ensured in private factories," asks Kachrual Chadawat of Pipliya. Nand Kishore and Mohan Singh, two farmers who have come to sell garlic at the Dalauda Mandi in Mandsaur, echo this sentiment. "We do not cultivate opium even on an inch of land more than what is

earmarked by the government. Narcotics officials mark the area twice after giving a license to ensure that the area is properly fenced. They monitor cultivation by visiting the farm at least half a dozen times during the season (November to March)." The farmers say they are already experiencing losses. To cultivate 10 ares of land, they spend about ₹1 lakh. They used to get 1-1.5 quintals (1 quintal is 100 kg) of poppy seeds from 10 ares under the earlier system. Under the CPS, they get about 80 kg of seeds. They complain that the government has stopped procuring poppy petals and pods from them, which it used to do earlier. Poppy seeds fetch farmers about ₹1,000 a kg. This is the main source of revenue for most opium farmers. "We used to get ₹1 lakh-1.5 lakh by selling seeds during one season. That would meet our expenses. But under the CPS, we will get fewer quantities of seeds," say farmers. The government procures CPS for ₹200 for a kg. Parmanand Patidar, another farmer in the area who holds a licence for extracting opium gum, complains that the government did not consult the farmers before opening up production to private players. "This is the second year of the CPS system. The Centre brought this scheme during the lockdown without holding any meeting with the farmers, just as it did with the three farm laws. In our village, 150 farmers have licences of which half are under CPS. This is being done only to divide the farmers," he says.

'No transparency' Farmers allege that there is no transparency in the CPS mechanism. "The government could consider a policy which will enable farmers to sell the additional opium gum (extracted over and above the limit set by the government) in the open market monitored by the government," suggests Ambalal Jat, a farmers' leader from Neemuch. Despite their unhappiness, the farmers are scared to speak up fearing that their licences will be cancelled, adds Jat. Nerulal Jat, president of the Bharatiya Kisan Union (Tikait) of Chittorgarh district, says he has been cultivating opium since 1980. "The procurement price of opium gum has been same all this time. Foreign companies will benefit from the CPS system. The old system should be continued to protect farmers. New factories should be opened under the public sector," he says. Farmer leaders agree that smugglers roam around the locality in search of farmers in distress. They say that there are farmers who are involved in the smuggling of opium.

# Branded, generic and the missing ingredient of quality

Many patients seek or solicit a second opinion in a medical shop — that of the seller. Any school finalist or school drop-out who can read a doctor's prescription in English or mysterious scribbling will do. It need not be a qualified pharmacist. Queries range from, "Is this medicine too strong?" "What is this medicine for?" to "Does it have any serious side-effects?" The replies are supposed to be pro bono or free under the guarantee that the prescribed medicines will be bought from the same medical shop. The prescription may have been written out by the most famous cardiologist, neurologist or gastroenterologist, but it is the verdict in the medical shop that is accepted without any doubt. The same person will not ask any questions at a bar counter or liquor shop on whether alcohol is injurious to health, or what the chances are of developing fatty liver, cirrhosis and liver failure. Nor will he ask the person at a shop selling cigarettes whether cigarettes will affect his lungs or cause cancer. In a supermarket, customers ignore the insecticide coating on vegetables and fruits and will never ask a question about safer alternatives. Generic over brand

This is the reality of over-the-counter sales in India, where a salesperson can decide which brand of generic medicine (pharmacological compound) can be given to a patient. The prescribing doctor has no freedom to mention his favourite brand in which he has invested his faith in terms of quality. On August 3, 2023, the National Medical Council (NMC) directed all doctors to prescribe only generic names and not brand names which led to protests. Brand names are shunned because many brands are costly. Generic names are much cheaper. In 1975, the Hathi Committee demanded that all brand names should be weeded out gradually. That only certain renowned and branded companies have quality is a myth propagated by the big pharma companies, with their expensive propaganda and unethical marketing techniques at work. There is an alleged nexus between pharmaceutical companies and doctors who can be influenced to give in to unethical marketing and promotional offers or kick-backs. But the Indian Medical Association and allied professional organisations of specialists believe that improving access to affordable medicines is part of their ethical commitment to patients. A doctor's reputation on successful treatment depends on the reliability of the quantity and quality of the active pharmaceutical ingredient in a tablet, syrup or injection available in a pharmacy. But who will guarantee compliance with those quality parameters? Individual manufacturers? The networks of pharmaceutical industries, Indian standards and quality control? Price control authorities? No compromise on quality

The prevalence rate of spurious and "not standard quality" medicines (NSQs), stands at 4.5% and 3.4 %, respectively, as shown by two national drug surveys in the last 10 years using thousands of samples from retail chemists across India. In safeguarding a patient and enabling complete

healing, drugs must be 100% quality tested. Having even 5% of medicines failing to pass quality tests is simply unacceptable. The government must ensure the quality of medicines produced, procured, and supplied through its Universal Health Coverage system as well as the private health-care network. For this, there has to be periodic lifting of samples for testing. Batches of medicines that fail the quality test must be banned, with punitive action taken against manufacturers. This will eliminate repeat defaulters from the supply chain. The mechanism and systems are in place but are not implemented in earnest.

The Tamil Nadu Medical Services Corporation Limited's practice, where all supplied medicines are kept under quarantine stock till double blinded samples are cleared in quality testing by government and private sector laboratories, is worth replicating. It is only on receipt of a pass quality test report that stock entry is done. Till such time as the government is able to make the assurance (with concrete evidence) that all medicines in the market are of standard quality, doctors should be allowed to use in their generic prescription, the name of the company (in brackets), in which the prescribing doctor has confidence in in terms of the quality of the medicine. Without such a reliable assurance from the government, it does not have the moral right to enforce prescription only by generic name. Moreover, control over choosing the brand will pass on to the chemist, or, even worse, the half-knowl-



edgeable sales boy who, it is feared, will decide the brand primarily on the basis of profits to be gained.

The availability rate of all essential medicines must be above 90%. In a study of the availability of 50 essential paediatric medicines in Chhattisgarh, in 2010 — the first of its kind in India — my team calculated it to be only 17%. Non-essential vitamin tonics and cough syrups line the shelves in a pharmacy but there is no trace of the low profit-margin essential medicines. There must also be a ban on unscientific combinations of medicines — currently around 40% of the retail market in India. To ensure affordable medicines for all under Universal Health Care, free medicines and free diagnostics are acceptable policy, but

implementation needs to be monitored. The network of Janaushadhi kendras needs to be expanded. Approved norms of the profit margin for wholesale agents must be limited to 15%. For retailers it must be 35% over the ex-factory or manufacturer's selling prices (MSP) excluding transportation cost and VAT. Without these comprehensive measures, accessibility to cheaper medicines in India will be a mirage. Following the Indian Medical Association's protest, the NMC has withdrawn the order on 'generic prescribing' since August 23, 2023. But this is only a case of one step forward but two steps back in moving to the goal of universal access to affordable generic medicines for all without brand names.

## Amazon lays off hundreds in its Alexa division as it pushes resources into AI

Amazon is cutting hundreds of jobs in the unit that handles its popular voice assistant Alexa as it pushes more resources into artificial intelligence. In a note to employees on Friday, Daniel Rausch, Amazon's vice president of Alexa and Fire TV, wrote that the company is eliminating certain roles because it is ditching some initiatives.

"As we continue to invent, we're shifting some of our efforts to better align with our business priorities, and what we know matters most to customers — which includes maximising our resources and efforts focused on generative AI," Rausch wrote. He said "several hundred" positions would be cut but did not give a more precise figure.

Seattle-based Amazon is in fierce competition with other tech companies rushing to capitalise on the generative AI craze. The company has been implementing a host of AI initiatives in the past few months, from infusing the technology into customer reviews to providing services that allow developers to build their own AI tools



on its AWS cloud infrastructure. In September, Amazon unveiled an update to Alexa that infuses it with more generative AI features. The job cuts announced on Friday will impact employees in the U.S., Canada and India. It follows more recent

layoffs in Amazon's gaming and music teams, and also adds to the 27,000 employees the company laid off during the later parts of last year and earlier this year. Amazon's Alexa unit was also impacted by those cuts.